SEQUENCE LISTING

(1) GENERAL INFORMATION:

      (i) APPLICANT: Michael J. Heller
                                          Eugene Tu
                                          Glen A. Evans
                                          Ronald G. Sosnowski

      (ii) TITLE OF INVENTION: SELF-ADDRESSABLE SELF-ASSEMBLING
MICROELECTRONIC SYSTEMS AND
DEVICES FOR
MOLECULAR BIOLOGICAL ANALYSIS
AND
DIAGNOSTICS

      (iii) NUMBER OF SEQUENCES: 44

      (iv) CORRESPONDENCE ADDRESS:

         (A) ADDRESSEE: Lyon & Lyon
         (B) STREET: 633 West Fifth Street
         (C) CITY: Los Angeles
         (D) STATE: California
         (E) COUNTRY: USA
         (F) ZIP: 90071

      (v) COMPUTER READABLE FORM:

         (A) MEDIUM TYPE: 3.5" Diskette, 1.44 Mb storage
         (B) COMPUTER: IBM Compatible
         (C) OPERATING SYSTEM: IBM P.C. DOS (Version 5.0)
         (D) SOFTWARE: WordPerfect (Version 5.1)

      (vi) CURRENT APPLICATION DATA:

         (A) APPLICATION NUMBER: 08/271,882
         (B) FILING DATE: July 7, 1994
         (C) CLASSIFICATION:

      (vii) PRIOR APPLICATION DATA:

         (A) APPLICATION NUMBER: 08/146,504

         (B) FILING DATE: November 1, 1993

      (viii) ATTORNEY/AGENT INFORMATION:

         (A) NAME: Murphy, David B.
         (B) REGISTRATION NUMBER: 31,125

(2) INFORMATION FOR SEQ ID NO: 1:

        (i) SEQUENCE CHARACTERISTICS:

             (A) LENGTH: 24
             (B) TYPE: nucleic
acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

GCT AGC CCC TGC TCA TGA GTC TCU   24

(2) INFORMATION FOR SEQ ID NO: 2:

        (i) SEQUENCE CHARACTERISTICS:

             (A) LENGTH: 24
             (B) TYPE: nucleic
acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

AAA AAA AAA AAA AAA AAA AAU   24

(2) INFORMATION FOR SEQ ID NO: 3:

        (i) SEQUENCE CHARACTERISTICS:

             (A) LENGTH: 34
             (B) TYPE: nucleic
acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

CTA CGT GGA CCT GGA GAG GAA GGA GAC TGC CTG U   34

(2) INFORMATION FOR SEQ ID NO: 4:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 20
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

GAG TTC AGC AAA TTT GGA GU   20

(2) INFORMATION FOR SEQ ID NO: 5:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 20
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

CGT AGA ACT CCT CAT CTC CU   20

(2) INFORMATION FOR SEQ ID NO: 6:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 18
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

GTC TCC TTC CTC TCC AGU   18

(2) INFORMATION FOR SEQ ID NO: 7:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 20
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

(ii) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

GAT GAG CAG TTC TAC GTG GU   20

(2) INFORMATION FOR SEQ ID NO: 8:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 18
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

CTG GAG AAG AAG GAG ACU   .   18

(2) INFORMATION FOR SEQ ID NO: 9:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 22
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

TTC CAC AGA CTT AGA TTT GAC U   22

(2) INFORMATION FOR SEQ ID NO: 10:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 20
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

TTC CGC AGA TTT AGA AGA TU   20

(2) INFORMATION FOR SEQ ID NO: 11:

(i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 20
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

            (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 11:

TGT TTG CCT GTT CTC AGA CU   20

(2) INFORMATION FOR SEQ ID NO: 12:

            (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 20
                    (B) TYPE: ·   nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

            (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 12:

CAT CGC TGT GAC AAA ACA TU   20

(2) INFORMATION FOR SEQ ID NO: 13:

            (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 20
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

            (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 13:

TGC GAG CTG CAG TCA GAC AT   20

(2) INFORMATION FOR SEQ ID NO: 14:

            (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 18
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

(ii) SEQUENCE DESCRIPTION: SEQ ID NO: 14:

GAG AGA CTC ATG AGC AGG   18

(2) INFORMATION FOR SEQ ID NO: 15:

            (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 18
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

            (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 15:

CCT GCT CAT GAG TCT CTC   18

(2) INFORMATION FOR SEQ ID NO: 16:

            (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 19
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

            (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 16:

TTT TTT TTT TTT TTT TTT T   19

(2) INFORMATION FOR SEQ ID NO: 17:

            (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 33
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

            (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 17:

CAG GCA GTC TCC TTC CTC TCC AGG TCC ACG TAG   33

(2) INFORMATION FOR SEQ ID NO: 18:

            (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

          (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 18:

CTC CAA ATT TGC TGA ACT C   19

(2) INFORMATION FOR SEQ ID NO: 19:

          (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 19
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

          (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 19:

GGA GAT GAG GAG TTC TAC G   19

(2) INFORMATION FOR SEQ ID NO: 20:

          (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 17
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

          (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 20:

CTG GAG AGG AAG GAG AC   17

(2) INFORMATION FOR SEQ ID NO: 21:

          (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 19
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

(ii) SEQUENCE DESCRIPTION: SEQ ID NO: 21:

CCA CGT AGA ACT GCT CAT C   19

(2) INFORMATION FOR SEQ ID NO: 22:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 17
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 22:

GTC TCC TTC TTC TCC AG   17

(2) INFORMATION FOR SEQ ID NO: 23:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 21
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 23:

GTC AAA TCT AAG TCT GTG AA   21

(2) INFORMATION FOR SEQ ID NO: 24:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 19
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 24:

ATC TTC TAA ATC TGC GGA A   19

(2) INFORMATION FOR SEQ ID NO: 25:

        (i) SEQUENCE CHARACTERISTICS:

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                        (A)  LENGTH:                    19
                        (B)  TYPE:                      nucleic
acid
                        (C)  STRANDEDNESS:              single
                        (D)  TOPOLOGY:                  linear


          (ii)  SEQUENCE DESCRIPTION:  SEQ ID NO:  25:

GTC TGA GAA CAG GCA AAC A                                    19


(2)  INFORMATION FOR SEQ ID NO:     26:

          (i)  SEQUENCE CHARACTERISTICS:

                        (A)  LENGTH:                    19
                        (B)  TYPE:                      nucleic
acid
                        (C)  STRANDEDNESS:              single
                        (D)  TOPOLOGY:                  linear


          (ii)  SEQUENCE DESCRIPTION:  SEQ ID NO:  26:

ATG TTT TGT CAC AGC GAT G                                    19


(2)  INFORMATION FOR SEQ ID NO:     27:

          (i)  SEQUENCE CHARACTERISTICS:

                        (A)  LENGTH:                    30
                        (B)  TYPE:                      nucleic
acid
                        (C)  STRANDEDNESS:              single
                        (D)  TOPOLOGY:                  linear


          (ii)  SEQUENCE DESCRIPTION:  SEQ ID NO:  27:

GGT GGT GGG CGC CGG CGG TGT GGG CAA GAU                      30


(2)  INFORMATION FOR SEQ ID NO:     28:

          (i)  SEQUENCE CHARACTERISTICS:

                        (A)  LENGTH:                    30
                        (B)  TYPE:                      nucleic
acid
                        (C)  STRANDEDNESS:              single
                        (D)  TOPOLOGY:                  linear


          (ii)  SEQUENCE DESCRIPTION:  SEQ ID NO:  28:
```

GGT GGT GGG CGC CGT CGG TGT GGG CAA GAU   30

(2) INFORMATION FOR SEQ ID NO: 29:

            (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 15
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

            (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 29:

CC GCG GCC GCC ACA C   15

(2) INFORMATION FOR SEQ ID NO: 30:

            (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 15
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

            (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 30:

CC GCG GCA GCC ACA C   15

(2) INFORMATION FOR SEQ ID NO: 31:

            (i) SEQUENCE CHARACTERISTICS:

                    (A) LENGTH: 15
                    (B) TYPE: nucleic
acid
                    (C) STRANDEDNESS: single
                    (D) TOPOLOGY: linear

            (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 31:

CC GTG GCA GCC ACA C   15

(2) INFORMATION FOR SEQ ID NO: 32:

            (i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 30
             (B) TYPE: nucleic
acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 32:

GGT GGT GGG CGC CGG CGG TGT GGG CAA GAU   30

(2) INFORMATION FOR SEQ ID NO: 33:

        (i) SEQUENCE CHARACTERISTICS:

             (A) LENGTH   29
             (B) TYPE: nucleic
acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 33:

GGT GGT GGG CGC CGG CGG TGT GGG CAA GA   29

(2) INFORMATION FOR SEQ ID NO: 34:

        (i) SEQUENCE CHARACTERISTICS:

             (A) LENGTH: 22
             (B) TYPE: nucleic
acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 34:

TGC CCA CAC CGC CGG CGC CCA C   22

(2) INFORMATION FOR SEQ ID NO: 35:

        (i) SEQUENCE CHARACTERISTICS:

             (A) LENGTH: 22
             (B) TYPE: nucleic
acid
             (C) STRANDEDNESS: single
             (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 35:

TGC CCA CAC CGA CGG CGC CCA C   22

(2) INFORMATION FOR SEQ ID NO: 36:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 22
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 36:

TGC CCA CAC CGA CGG TGC CCA C   22

(2) INFORMATION FOR SEQ ID NO: 37:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 7
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 37:

ACA CCG C   7

(2) INFORMATION FOR SEQ ID NO: 38:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 7
                (B) TYPE: nucleic
acid
                (C) STRANDEDNESS: single
                (D) TOPOLOGY: linear

        (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 38:

ACA ACG C   7

(2) INFORMATION FOR SEQ ID NO: 39:

        (i) SEQUENCE CHARACTERISTICS:

                (A) LENGTH: 31

(B) TYPE: nucleic
acid
                      (C) STRANDEDNESS: single
                      (D) TOPOLOGY: linear

          (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 39:

CCA GTC ACG ACG TTG TAA AAC GAC GGC CAG U   31

(2) INFORMATION FOR SEQ ID NO: 40:

          (i) SEQUENCE CHARACTERISTICS:

                      (A) LENGTH: 31
                      (B) TYPE: nucleic
acid
                      (C) STRANDEDNESS: single
                      (D) TOPOLOGY: linear

          (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 40:

GTA ATC ATG GTC ATA GCT GTT TCC TGT GTG U   31

(2) INFORMATION FOR SEQ ID NO: 41:

          (i) SEQUENCE CHARACTERISTICS:

                      (A) LENGTH: 40
                      (B) TYPE: nucleic
acid
                      (C) STRANDEDNESS: single
                      (D) TOPOLOGY: linear

          (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 41:

GCA TGC CTG CAG GTC GAC TCT AGA GGA TCC CCG GGT ACC G   40

(2) INFORMATION FOR SEQ ID NO: 42:

          (i) SEQUENCE CHARACTERISTICS:

                      (A) LENGTH: 40
                      (B) TYPE: nucleic
acid
                      (C) STRANDEDNESS: single
                      (D) TOPOLOGY: ´ linear

          (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 42:

TGC CAA GCT TGG CTG CAG GTC GAC GGA TCC CCG GGA ATT C   40

(2) INFORMATION FOR SEQ ID NO: 43:

    (i) SEQUENCE CHARACTERISTICS:

        (A) LENGTH: 24
        (B) TYPE: nucleic
acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 43:

AAA TTG TTA TCC GCT CAC AAT TGC   24

(2) INFORMATION FOR SEQ ID NO: 44:

    (i) SEQUENCE CHARACTERISTICS:

        (A) LENGTH: 24
        (B) TYPE: nucleic
acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) SEQUENCE DESCRIPTION: SEQ ID NO: 44:

ACA CAA CAT ACG AGC CGG AAG CAT   24